# Phase feeding for large and small stock in feedlots

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What purpose does it serve to apply phase feeding, an approach where different rations are fed during different phases in the feedlot? This is a question that is posed time and again, with producers often wondering whether there is a point to it, how many phases are really necessary, and whether or not it maximises the profitability of growing out and finishing animals in the feedlot.

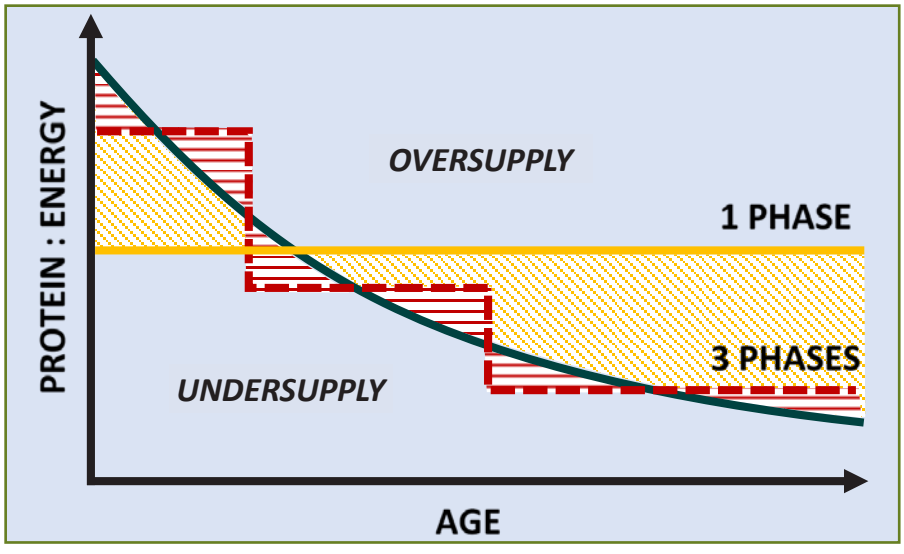
To answer these and other questions in a meaningful way, producers need to understand what phase feeding entails, as well as the reasons for it and the advantages it offers. Similar to any other operation or farming system, it must also be practically feasible within each producer's unique circumstances.

## What is phase feeding?

Phase feeding can be defined as the practice of giving animals different rations over relatively short periods of time, in order to closely meet their specific nutritional requirements at a set time, based on changes in their physiological growth patterns. Hence, it involves feeding successive feedlot rations that differ in terms of energy, protein and bypass protein content, among other things.

As the composition of the feed is adapted to the animal's nutritional requirements during a specific phase, the animal can theoretically utilise the nutrients better. Periods of under- or oversupply of specific nutrients are therefore kept as short as possible (*Figure 1*), thereby improving the efficiency of feed utilisation (feed conversion ratio).

**Figure 1: Phase feeding and the relationship between the protein-to-energy ratio and age.**




## Growth curves

In animals, the development and growth of different body components occur at different rates (*Figure 1*) from birth to maturity. Typically, the brain and soft tissues develop first. Thereafter, bone and skeletal growth (frame development) occurs, followed by accelerated muscle growth and eventually fat deposition, as animals approach physiological maturity.

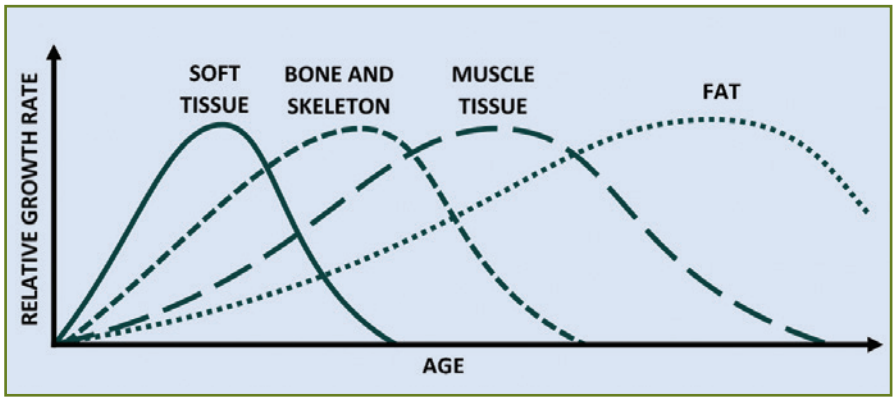
## Adjustment of feed composition

As a result, the need for protein, and especially high-quality protein, is significantly higher in younger animals, and lower in older and more mature animals. As animals age, their energy requirements increase, relative to protein. Put differently, the protein requirement for muscle and frame growth decreases, whereas the energy requirement for adipose tissue deposition increases.

In practice, the protein content of feed is gradually reduced during each phase. The same applies to natural protein included at the expense of non-protein nitrogen, in the case of ruminants. It also brings about a cost saving, as it reduces the need to include expensive natural protein.

It is important to note, however, that young animals still require enough energy for skeletal growth and deposition of muscle tissue. Ultimately, it is the energy-protein ratio, and more specifically the available amino acids, that matter most.

**Figure 2: Physiological growth curves of different body components.**




Another key point to consider is that the correct proportions of these amino acids must be present in order to improve utilisation and feed conversion.

## Practical considerations

The use of phase feeding in a feedlot, or any other production system, requires additional management inputs. In ruminants, the microbial population in the rumen must adapt to feed composition changes, especially when more energy and grain are included. A judicious, gradual approach is therefore needed when transitioning between phases.

The home-mixing of feed makes it easier to incorporate phase feeding, as it is quick and easy to adjust feed mixtures. Consequently, it is possible to gradually adapt animals to diets containing more concentrates through an incremental increase in the grain content, or by including less natural protein as the animals mature.

Having too many phases, however, is impractical and can complicate matters. In addition, it does not always maximise profit. This becomes even more apparent when ready-mixed or pelleted feed have to be purchased and stored for each phase.

In instances where smaller numbers of animals are fed and less feed is mixed or purchased at a time, or where little uniformity exists among groups of animals in the feedlot in terms of weight and age, phase feeding may present fewer advantages.

It is also important to remember that phase feeding requires accurate weighing of feed ingredients, as well as increased labour and management inputs. The scale and individual circumstances of each farm must therefore be considered.

In most cases two or three phases are more than enough to ensure practical, optimal feed conversion in feedlotted large and small stock. Therefore, the strategic application of phase feeding requires some thought. It is also best to consult an animal nutritionist in order to make informed decisions that will ensure long-term sustainable profitability. SF